Supreme Court, U.S.
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No. 95-

IN THE
Supreme Court of the United States
OCTOBER TERM, 1995

BP CHEMICALS LIMITED and
STERLING CHEMICALS, INC.,
Petitioners,

v.

HOECHST CELANESE CORPORATION,
Respondent.

Petition for Writ of Certiorari to the United States Court of Appeals for the Federal Circuit

PETITION FOR WRIT OF CERTIORARI

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QUESTIONS PRESENTED

1. Whether a court interpreting a technical term in a patent claim departs from the fair notice function of 35 U.S.C. § 112—which requires that a patent contain one or more claims that particularly point out and distinctly claim the invention—when it relies on extrinsic evidence, such as self-serving inventor testimony, that was not available to members of the public attempting in good faith to construe the patent.

2. Whether, as the Court must decide in *Warner-Jenkinson Co.* v. *Hilton Davis Chemical Co.*, No. 95-728, the doctrine of equivalents remains a viable legal doctrine under the Patent Act of 1952 and, if so, whether the proper legal standards for application of the doctrine were employed in this case.

LIST OF PARTIES

The only parties to this proceeding are the petitioners, BP Chemicals Limited and Sterling Chemicals, Inc., and the respondent, Hoechst Celanese Corporation.

RULE 29.6 LIST

Pursuant to Rule 29.6 of the Rules of this Court, petitioners state the following:

Petitioner BP Chemicals Limited states that its parent company is The British Petroleum Company p.l.c., and that it has the following nonwholly owned subsidiaries:

BP America Inc.
BP Capital BV (Netherlands)
BP Capital plc
BP Developments Australia Limited (US)
BP Exploration (Alaska) Inc.
BP Finance Australia Limited
BP Finance Australia (CP) Limited
BP France
BP Oil Espana SA
BP Oil New Zealand Limited
BP Overzee BV (Netherlands)
BP Pipelines (Alaska) Inc.
BP Portuguesa SA
Corporation Iberica de Nutricion SA (CINSA)
Service Station Holdings Inc. (US)
The Standard Oil Company (US)

Petitioner Sterling Chemicals, Inc. states that it does not have any parent companies or nonwholly owned subsidiaries.

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PETITION FOR WRIT OF CERTIORARI

Petitioners BP Chemicals Limited and Sterling Chemicals, Inc. respectfully petition for a writ of certiorari to review the judgment of the United States Court of Appeals for the Federal Circuit.

OPINIONS BELOW

The opinion of the court of appeals (Pet. App. 1a-17a) is reported at 78 F.3d 1575 (Fed. Cir. 1996). The opinion of the district court (Pet. App. 18a-33a) is reported at 846 F. Supp. 542 (S.D. Tex. 1994).

JURISDICTION

The United States Court of Appeals for the Federal Circuit rendered its judgment and opinion on March 19,

1996. This Court has jurisdiction under 28 U.S.C. § 1254(1).

STATUTORY PROVISIONS INVOLVED

35 U.S.C. § 112 provides in pertinent part:

> The [patent] specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

STATEMENT OF THE CASE

This is a patent infringement action alleging that petitioners infringed respondent's patent concerning a method for removing iodide compounds from organic media, such as acetic acid. The United States District Court for the Southern District of Texas had jurisdiction pursuant to 28 U.S.C. §§ 1338(a) and 2201.

1. Petitioners (collectively, "BP") produce acetic acid for commercial sale. In 1990, BP experienced an iodide contamination problem in its manufacturing process. When iodide is present in acetic acid even at very dilute concentrations, it can drastically and adversely affect certain chemical reactions in which acetic acid is commercially used. In particular, when acetic acid is catalytically converted to vinyl acetate, the presence of iodide in trace amounts can deactivate or "poison" the vinyl acetate catalyst. Pet. App. 2a. This can necessitate replacement of the catalyst, which is very costly.

To address the contamination problem, BP formed a task force in 1990 to develop an iodide removal method that would satisfy three objectives: (1) effectively remove low levels of iodide from acetic acid; (2) work on a commercial scale; and (3) not infringe any existing patents. After considering a number of ideas, including chemical treatments, gas treatments, and the use of ion exchange resins, the task force recommended a method

in which the contaminated acetic acid is passed through a bed of Purolite C-145 ion exchange resin beads that have been loaded with silver. A chemical reaction occurs between the silver in the resin beads and the iodide impurity, binding the iodide to the resin and thereby eliminating it from the acetic acid.

In recommending the Purolite resin process, the task force concluded that it did not infringe any existing patents, including respondent's United States Patent No. 4,615,806 ("the '806 patent"). The '806 patent claims protection for

> a method for removing iodide compounds from a non-aqueous organic medium comprising contacting the medium containing said iodide compounds with an ion exchange resin characterized in that the resin is a macroreticulated strong-acid cation exchange resin which is *stable* in the organic medium and has at least one percent of its active sites converted to the silver or mercury form.

Pet. App. 3a (emphasis added). The term "stable" is not defined in any of the patent claims, but is defined in the patent specification as meaning

> that the resin will not chemically decompose, or change more than about 50 percent of its dry physical *dimension* upon being exposed to the organic medium containing the iodide compounds.

Pet. App. 5a (emphasis added). Even though the meaning of the term "stable" turns on the meaning of the term "dimension," the latter term is not defined anywhere in the patent. The patent states that the preferred resin for the process is a commercially available product sold under the trade name "Amberlyst 15." Pet. App. 19a.

BP concluded that the use of Purolite C-145 did not infringe the '806 patent because it was not a "stable" resin, as that term is used in the patent. According to the patent specification, which BP carefully examined and

relied on, a "stable" resin is one that expands less than 50% in "dimension" from the dry state when exposed to acetic acid. Although the term "dimension" is not defined anywhere in the patent, BP reasonably understood "dimension" to mean "volume" because there are other references to volume change measurements in the patent [1] and the practice in the chemical industry is to measure volume changes in resins upon exposure to a solvent. In addition, volume expansion is one of the key parameters for designing a resin vessel that will not explode. BP therefore concluded that Purolite C-145 was an "unstable" resin because it expanded more than 50% in volume when exposed to acetic acid. In order to confirm that its method did not infringe respondent's patent, BP performed tests which proved that C-145 swelled over 100 percent, double the 50 percent expansion maximum specified for respondent's method. In April 1992, BP began using the Purolite process in the United States.

In January 1993, much to BP's surprise, respondent sued it for infringing the '806 patent. BP was confident that it had not infringed the patent, and sent respondent a sample of the Purolite C-145 resin, together with a test protocol and the actual results of a test establishing that it swelled more than 100%. BP believed that the sample and test results demonstrated conclusively that the Purolite C-145 resin was not "stable" within the meaning of

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[1] The patent contains several references to the volumes of particular resins, and to changes in volume when resins are exposed to a solvent. For instance, all of the examples in the patent begin with a description of the volume of the resin under investigation. In addition, the patent specification contains a table copied from the Amberlyst 15 manufacturer's technical bulletin that reports the *volume* expansion of the resin from the dry state when it is saturated with a range of solvents. Pet. App. 9a. This same technical bulletin, which was submitted to the Patent and Trademark Office and was readily available to the public, contains a cautionary note about the expansion of Amberlyst 15 because the resin columns can shatter or explode if they are designed without taking the swelling into account.

the patent, and therefore, that BP's iodide-removal process did not infringe. Respondent, however, adhered to its view that BP was infringing its patent. It explained that the intent of the inventor—an intent that is not expressed anywhere in the patent—was for the term "dimension" to refer to a linear measurement, such as diameter or radius, rather than to volume. Under this interpretation, Purolite C-145 was a stable resin because it expanded less than 50% in *diameter* when exposed to acetic acid, and BP's process therefore infringed respondent's patent.[2]

Respondent's infringement suit was tried to a jury in January 1994. The jury was instructed both on literal infringement and on infringement under the doctrine of equivalents. Although the parties had agreed that claim interpretation is a question of law for the court, the court refused BP's request to instruct the jury on the proper interpretation of the term "stable" in the patent.[3] After a seven-day trial, the jury returned a verdict finding that BP had infringed the '806 patent, and that the infringement was willful. The verdict did not identify whether the jury had found literal infringement or infringement under the doctrine of equivalents. The jury awarded respondent a royalty of 0.6 cents per pound for each pound of acetic acid that BP had treated.

2. During trial, the district court denied BP's motion for judgment as a matter of law. Thereafter, in its findings of fact and conclusions of law, the court conceded

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[2] The volume of a spherical object is related to the object's radius by the formula: $V = 4/3\pi r^3$. Thus, a small percentage change in radius or diameter results in a much larger percentage change in volume. For example, a 50 percent increase in diameter results in a volume increase of 337 percent.

[3] BP's position at trial was that the meaning of the terms "stable" and "dimension" in the patent are clear because the patent indicates unambiguously that "dimension" refers to volume. Because of this belief, BP stipulated in the pretrial order that the provisions of section 112 were satisfied. The terms are ambiguous only when construed in the light of extrinsic evidence that BP considers improper and irrelevant.

that the definition of "stable" in the '806 patent presented a "close[]" question, Pet. App. 21a, but nevertheless concluded that "substantial evidence supports a conclusion that Purolite C-145 is 'stable' within the literal meaning of the '806 patent." Pet. App. 22a. Alternatively, the district court concluded that the jury permissibly could have found infringement under the doctrine of equivalents. *Id.* Finally, the district court made its own finding of infringement under the doctrine of equivalents, noting that the *en banc* Federal Circuit was at that time considering the question whether the doctrine of equivalents is properly an issue for the jury or for the court. Pet. App. 23a. See *Hilton Davis Chem. Co.* v. *Warner-Jenkinson Co.*, 62 F.3d 1512 (Fed. Cir. 1995) (en banc), *cert. granted*, 116 S. Ct. 1014 (Feb. 26, 1996).

3. The Federal Circuit affirmed. Consistent with its recent decision in *Markman* v. *Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995) (en banc), which itself has since been affirmed by this Court, 116 S. Ct. 1384 (1996), the Federal Circuit stated that it had to decide *de novo* the disputed issues of claim interpretation relating to the terms "stable" and "dimension," without deference to the jury. Pet. App. 3a-4a. The court noted that the evidence was "sharply in conflict" as to the meaning of those critical terms. Pet. App. 6a. It found that the parties' technical experts gave conflicting testimony as to the accepted meaning of the terms to those experienced in the field of the invention, Pet. App. 6a-7a, and that the parties' proffered dictionary definitions failed to "distinguish in a dispositive manner between the contested technical meanings," Pet. App. 7a. The court also reviewed other information in the patent specification that it characterized as referring either to volume measurements or linear measurements,[4] but did not reach any

[4] Some of the Federal Circuit's characterizations of references in the patent were unsupported by the trial record. For example, the court cited a portion of the patent specification that "shows the resin characteristic of mesh size of the dry resin, a linear

conclusion as to the significance of these references for the interpretation of the terms in the patent. Pet. App. 9a.

The Federal Circuit then turned to the testimony of the inventor, Dr. Hilton, who is employed by respondent and who testified that he meant "dimension" to refer to a linear measurement, *i.e.*, the radius of an individual resin bead. The Federal Circuit's decision includes lengthy quotations from Dr. Hilton's testimony, both on direct and cross-examination. Pet. App. 7a-8a. It noted that the district court had found Dr. Hilton's testimony to be "highly credible," and that his testimony read like that of an "expert in the field." Pet. App. 8a. While acknowledging that it was required under its decision in *Markman* to give "no deference" to the testimony of an inventor as to the meaning of the patent claims, the court noted that Dr. Hilton's testimony "enlarg[ed] our understanding of the technology and the usage of the disputed terms." Pet. App. 9a.

Finally, the Federal Circuit noted that the district court had observed that tests proffered by BP at trial appeared to indicate that the resin specified in the patent as the preferred embodiment of the invention—the Amberlyst 15 resin—expands slightly more than 50% in volume when placed in acetic acid. *Id.* The Federal Circuit concluded, contrary to the inventor's testimony, that under BP's interpretation of the patent, this preferred embodiment would be *excluded* from the patent. The court deemed it "unlikely that an inventor would define the invention in a way that excluded the preferred embodiment, or that persons of skill in this field would read the specification in such a way." *Id.* This was despite

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measure based on diameter." Pet. App. 9a. No witness at trial, however, including respondent's experts, testified that the mesh size for dry resins has any bearing on whether a dry resin's expansion upon contact with a liquid is measured by volume or diameter. Thus, the Federal Circuit's reliance on the mesh size reference has no support in the record.

the fact that the inventor's largest measurement showed a volume increase of 37%, which was well within BP's 50% interpretation. Accordingly, the Federal Circuit accepted respondent's interpretation of the term "stable," and concluded that there was literal infringement based on that interpretation. Pet. App. 10a.

The Federal Circuit declined to address BP's argument that because respondent did not present sufficient evidence of equivalents, the issue of equivalents should not have been submitted to the jury. The court noted that BP had not clearly preserved this issue in its directed verdict motion, and that the court's finding of literal infringement was sufficient to sustain the jury's general verdict of infringement. Pet. App. 10a-13a.

REASONS FOR GRANTING THE PETITION

This case raises questions of fundamental importance to patent law and patent litigation. The first question presented asks what types of extrinsic evidence courts may rely on in interpreting patent claims. This is of almost universal importance in patent litigation because claim interpretation is a central issue in nearly every patent infringement suit. This question also raises fundamental issues concerning the patentholder's duty to give the world clear notice of the subject matter which the patent monopolizes. Under the approach adopted by the Federal Circuit in this case, patentholders need not draft clearly worded patent claims because they will get the benefit in litigation of *post hoc* inventor testimony regarding the inventor's subjective intent concerning the scope of the claims. This departure from the strict notice principles of patent law inevitably will create great uncertainty for third parties seeking to determine the scope of existing patents. The second question presented—concerning the proof needed to establish infringement under the doctrine of equivalents—likewise implicates the notice principles underlying the patent law. It raises the issue of whether and to what extent patent protection should be extended

beyond the literal scope of the claims drafted by the patentee.

While both questions are worthy of this Court's attention, this petition should not be considered without regard to the Court's recent decision in *Markman*, and its grant of certiorari in *Hilton Davis*. The Court's actions in *Markman* and *Hilton Davis* place a renewed emphasis on the importance of certainty and predictability in the patent system. In *Markman*, this Court emphasized the critical role of certainty by holding that claim interpretation is a question of law that must be decided by the court, rather than a question for the jury. The question to be resolved in *Hilton Davis* is whether patent protection extends beyond the boundaries defined by the patent claims. The first question presented in this case is the logical next step in resolving the issues raised in *Markman* and *Hilton Davis* because it addresses another aspect of the notice/certainty problem: whether in interpreting the meaning of patent claims courts may consider information that was not available to the general public prior to litigation. This case is thus a fitting continuation to *Markman* and *Hilton Davis* because the manner in which courts interpret patent claims always will affect how patents are drafted and how they are read by the public.

Indeed, the claim interpretation issue is arguably *more* important to the predictability of the patent system than either of the questions presented in *Markman* or *Hilton Davis*. The judge/jury issue resolved in *Markman* was a procedural question that will not necessarily affect substantive outcomes in a systematic way. Moreover, this procedural issue was of recent origin because only recently did juries begin routinely to decide claim interpretation issues. Claim interpretation, however, has always been at the heart of infringement cases. Indeed, claim construction is critical to resolving claims of infringement both under the theory of literal infringement and under the doctrine of equivalents. The doctrine of equivalents requires a comparison between the accused

device and the patent claims, as they are construed by the court. Thus, whether or not the doctrine of equivalents survives *Hilton Davis*—and particularly if it does —claim construction issues will loom large in most infringement suits, and determine the results in many. Thus, inconsistent standards and methods for claim construction will undermine the certainty of the patent system by giving rise to inconsistent and unpredictable results in infringement cases.

Because this case presents a logical, and critical, third stage in this Court's examination of basic issues relating to certainty in the patent system, the Court should grant the petition. Alternatively, the Court should hold this petition, pending its decision in *Hilton Davis*. The issues raised by the first question presented in the petition inevitably will be affected by the Court's analysis of notice principles in *Hilton Davis* as they bear on the question whether patent protection should extend beyond the literal terms of patents. The issues raised by the second question presented plainly overlap one of the primary issues in *Hilton Davis*, *i.e.*, whether the doctrine of equivalents survived in the Patent Act of 1952. Accordingly, the Court, at a minimum, should hold the petition until *Hilton Davis* is decided, and then either grant the petition, or remand the case to the Federal Circuit in light of the *Hilton Davis* decision.

I. THE FEDERAL CIRCUIT'S USE OF EXTRINSIC EVIDENCE THAT WAS NOT AVAILABLE TO PETITIONERS IN INTERPRETING A PATENT CLAIM PRESENTS AN IMPORTANT QUESTION OF PATENT LAW, AND IS FLAWED ON THE MERITS.

The Federal Circuit's decision in this case has widespread implications for patent litigation, and for the inventive process that is inevitably affected by litigation outcomes. The methods by which courts interpret patent claims are of critical importance to the field of patent law and to the general public. Claim interpretation de-

termines the practical scope of patent protection. Indeed, there is no substantive difference between expanding patents through impermissibly broad claim constructions, and expanding them through the doctrine of equivalents. In short, the process by which courts interpret patent claims affects how patent claims are drafted, how patent suits are litigated and, in the aggregate, the outcomes of infringement suits. See *Markman*, 52 F.3d at 989 (Mayer, J., concurring) ("[T]o decide what the claims mean is nearly always to decide the case").

1. What makes the Federal Circuit's holding in this case particularly important is that the decision signals a reversal of that court's position concerning the appropriateness of considering evidence of the inventor's subjective intent during the claim interpretation process. In this case, the court turned its back on its precedent by relying on the testimony of the inventor as to his intent in describing his invention where all of the objective evidence—testimony from technical experts in the field, dictionary definitions, and the language of the patent specification—was found to be inconclusive.[5] The objec-

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[5] *See, e.g., Markman* v. *Westview Instruments, Inc.*, 52 F.3d 967, 983 (Fed. Cir. 1995) (en banc), *aff'd*, 116 S. Ct. 1384 (1996); *North Am. Vaccine, Inc.* v. *American Cyanamid Co.*, 7 F.3d 1571, 1577 (Fed. Cir. 1993) ("after-the-fact" testimony of inventor as to what he "intended" to include in the patent is entitled to "little weight"), *cert. denied*, 114 S. Ct. 1645 (1994); *Intellicall, Inc.* v. *Phonometrics, Inc.*, 952 F.2d 1384, 1388 (Fed. Cir. 1992) (district court properly ignored testimony of inventor as to the "secretly held intended meaning" of patent); *Senmed, Inc.* v. *Richard-Allan Medical Indus., Inc.*, 888 F.2d 815, 819 & n.8 (Fed. Cir. 1989) (rejecting inventor's "self-serving, *post-hoc* opinion testimony" as to the meaning of patent terms); *Lear Siegler, Inc.* v. *Aeroquip Corp.*, 733 F.2d 881, 888-89 (Fed. Cir. 1984) ("litigation-induced pronouncements" of inventor have no effect on court's analysis of patent terms).

While the Federal Circuit in this case stated the rule from *Markman* that it could give "no deference" to the testimony of the inventor about the meaning of the claims, Pet. App. 9a, the result in this case makes plain that it did not adhere to that

tive, publicly available sources for discerning the meaning of respondent's patent were fully consistent with petitioners' construction and determination that there was no infringement. Only by turning to subjective evidence was it possible to arrive at a claim construction that exposed petitioners to a risk of infringement.[6]

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approach. Because the other objective evidence—the patent documents, dictionary definitions, and expert testimony—was inconclusive, the inventor's testimony was not "cumulative," as the court asserted, but instead was dispositive. *Id.* Indeed, the court's reliance on the inventor's testimony was particularly egregious because under all of the traditional types of extrinsic evidence, petitioners' interpretation of the patent and respondent's interpretation were, at best, equally plausible. As such, judgment should have been entered in favor of petitioners. *See Athletic Alternatives, Inc.* v. *Prince Mfg., Inc.*, 73 F.3d 1573, 1581 (Fed. Cir. 1996) ("Where there is an equal choice between a broader and a narrower meaning of a claim . . . we consider the notice function of the claim to be best served by adopting the narrower meaning").

[6] The Federal Circuit also relied on its view that under petitioners' interpretation of the patent, the resin listed in the patent as the "preferred embodiment" for the invention, Amberlyst 15, would be excluded from coverage because it swells more than 50% in volume when exposed to acetic acid. *This view is contrary to the record* and, in any event, based on evidence that should have been irrelevant to the claim interpretation process. At the time the patent was drafted, the largest volume increase that the inventor had measured for Amberlyst 15 was 37%. Accordingly, petitioner's interpretation of the patent is wholly consistent with what the inventor and respondent knew at the time of its drafting.

In contrast, the information about the swelling characteristics of Amberlyst 15 that the Federal Circuit relied on was not known to either party until petitioners performed additional tests *after* this litigation began, some 15 years after the patent was drafted. Thus, the Federal Circuit improperly relied on information concerning the swelling characteristics of Amberlyst 15 that was not only unavailable to petitioners when they construed the patent, but also unknown to respondent when the claims were drafted. In any event, the Federal Circuit's conclusion with respect to the new test results is not supported by any of the trial testimony. To the contrary, Dr. Hilton *conceded* in his testimony that even under petitioners' tests, which showed a volume increase in

This change of course in the decisional law in the Federal Circuit is inconsistent with the notice principles of the patent law and will cause great uncertainty about the scope of existing patents. The views of the inventor, unlike the objective sources of evidence traditionally used for interpreting technical terms (*e.g.*, patent documents, prosecution history, treatises and scientific articles), are completely unavailable to members of the public who endeavor to respect the patent in good faith. Indeed, the testimony of the inventor may be entirely a product of litigation, as it is designed to resolve an ambiguity in the patent that cannot be resolved through other sources of extrinsic evidence.

The Federal Circuit's reliance on information that was not part of the patent and unavailable to petitioners vitiates the notice provision of the patent law. The provision requires that the patent claims "particularly point[] out and distinctly claim[] the subject matter which the applicant regards as his invention." 35 U.S.C. § 112. The requirement that the patentholder draft his claims with particularity is designed to ensure that the world receive definite notice of the invention that is to be protected and, correspondingly, definite notice of any subject matter that is not within the scope of the patent and therefore can be freely used. See *Markman* v. *Westview Instruments, Inc.*, 116 S. Ct. 1384, 1387 (1996) ("It has long been understood that a patent must describe the exact scope of an invention and its manufacture to 'secure to [the patentee] all to which he is entitled, [and] to apprise the public of what is still open to them.' ") (quoting *McClain* v. *Ortmayer*, 141 U.S. 419, 424 (1891)); *Bonito Boats, Inc.* v. *Thunder Craft Boats, Inc.*, 489 U.S. 141, 150-51, 159 (1989) (the federal patent system holds out a bargain "of disclosure in ex-

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Amberlyst 15 of slightly over 50%, Amberlyst 15 was *not* excluded from the patent. Furthermore, Dr. Hilton testified that he never measured a linear change in diameter—that he only measured change in volume, with the largest measured increase at 37%.

change for exclusive use"); *Universal Oil Prods. Co.* v. *Globe Oil & Refining Co.*, 322 U.S. 471, 484 (1944) ("*quid pro quo*" for monopoly is "precision of disclosure"). Under the Federal Circuit's decision, however, the process of claim interpretation by third parties is relegated to a guessing game.

Without clear and definite notice, inventors cannot ascertain the limits of existing patents, and as a result are chilled from pursuing innovations for fear of inadvertently invading existing patent rights. See *Universal Oil*, 322 U.S. at 484-85 (claims must be stated with specificity "for the very purpose of protecting the public against extension of the scope of the patent"); *United Carbon Co.* v. *Binney & Smith Co.*, 317 U.S. 228, 236 (1942) ("A zone of uncertainty which enterprise and experimentation may enter only at the risk of infringement claims would discourage invention only a little less than unequivocal foreclosure of the field"). Thus, the notice requirement ensures the predictability and certainty that this Court has recognized are critical to a sound patent system. *United Carbon*, 317 U.S. at 232 ("The [patent] statute seeks to guard against unreasonable advantages to the patentee and disadvantages to others arising from uncertainty as to their rights").

While patent documents are supposed to provide precise notice of the scope of protected inventions, the practical reality is that courts often must examine extrinsic evidence in order to determine the meaning of technical language and terms in patent documents. This is because patents are directed to and written for those who are skilled in particular technical arts. As a result, courts often need help if they are to construe patent documents "as one skilled in the art would construe them." *SmithKline Diagnostics, Inc.* v. *Helena Lab. Corp.*, 859 F.2d 878, 882 (Fed. Cir. 1988); *Specialty Composites* v. *Cabot Corp.*, 845 F.2d 981, 986 (Fed. Cir. 1988).

In construing patent documents, courts always begin with the language of the claims themselves, as well as

other portions of the documents, such as the specification and the other claims that are not at issue. *North Am. Vaccine* v. *American Cyanamid Co.*, 7 F.3d 1571, 1575 (Fed. Cir. 1993), *cert. denied*, 114 S. Ct. 1645 (1994); *SmithKline Diagnostics*, 859 F.2d at 882. When the documents are not dispositive, courts turn to extrinsic sources that educate them as to how those skilled in the art use and understand particular technical terms. Such sources include, *inter alia*, dictionaries, learned treatises, scientific articles, and expert testimony. See, *e.g.*, *Markman* v. *Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995) (en banc), *aff'd*, 116 S. Ct. 1384 (1996). This evidence, all of which is publicly available, "may be helpful to explain scientific principles, the meaning of technical terms, and terms of art that appear in the patent and prosecution history." *Id.*

In this case, the Federal Circuit relied on a type of extrinsic evidence that is wholly different in kind and purpose—litigation-induced testimony of the inventor as to what the patent was *intended* to cover. Such testimony is different from testimony that inventors routinely give as experts in the relevant art. Inventors, not surprisingly, are often specialists in a particular field who can explain scientific principles and terms of art to the court. Accordingly, they are frequently proffered as technical experts. In this case, however, the inventor, Dr. Hilton, was not merely proffered as a technical expert to help the court understand scientific terminology, but also testified as to what he *intended* the terms "stable" and "dimension" to mean when the patent document was drafted. This "intent" testimony was nothing more than an attempt to cure a deficiency that rendered the patent subject to conflicting interpretations. All of the objective evidence, including the expert testimony, was inconclusive as to the accepted meaning of the disputed terms—suggesting that there is *no* standard meaning in the field for

those terms.[7] Thus, the term "dimension" should have been defined in the patent. Dr. Hilton's subjective testimony as to how he *meant to define* the term was a transparent attempt to fill that gap.

While expert testimony by inventors is fully consistent with the purposes of the patent laws, inventor testimony concerning the *intended* meaning of badly-drafted patent documents flies in the face of the patent law's notice provision. That provision places the burden on patentees to draft their claims and specifications with particularity so that the public can have clear notice of the limits of existing patents. See, *e.g.*, *General Elec. Co.* v. *Wabash Appliance Corp.*, 304 U.S. 364, 369 (1938) ("*The inventor* must 'inform the public during the life of the patent of the limits of the monopoly asserted' ") (quoting *Permutit Co.* v. *Graver Corp.*, 284 U.S. 52, 60 (1931)) (emphasis added); *White* v. *Dunbar*, 119 U.S. 47, 52 (1886) ("The claim is a statutory requirement, prescribed for the very purpose of making *the patentee* define precisely what his invention is") (emphasis added). When a patentee fails to meet this burden, courts should not rely on *post hoc* inventor testimony to rescue the patentee from the consequences of his own deficient explanations. Inventor testimony is not available to members of the public who must construe patents *ex ante*, and the purposes of the notice provision are contravened—as are principles of fundamental fairness—when courts

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[7] The panel recognized that its prior decision in *Markman* "limits appellate reliance on extrinsic evidence to evidence in explanation of the technology and technical terms," and precludes appellate courts from " 'crediting certain evidence over other evidence,' " Pet. App. 5a (quoting *Markman*, 52 F.3d at 981), but then stated that it had found it necessary to "credit certain evidence over other evidence," Pet. App. 6a, in construing the '806 patent because the evidence was sharply in conflict. This statement is revealing both because it demonstrates that there was more than one reasonable interpretation of the patent supported by objective extrinsic evidence, and because it illustrates the unresolved tension within the Federal Circuit on claim interpretation issues.

rely on such testimony *ex post* to resolve infringement suits. This is particularly true where, as here, the inventor is still employed by the patentholder and his opinion is unquestionably "litigation induced."

In sum, the Federal Circuit's reliance on inventor testimony to construe patents injects uncertainty and arbitrariness into the system, and contravenes the express requirement of section 112 that the patent claims "particularly point[] out and distinctly claim[] the subject matter which the applicant regards as his invention." To put it simply, the methodology followed by the Federal Circuit in this case converts claim interpretation into a guessing game. Indeed, the guessing game as shown here can be a very dangerous one in which inventors risk being held liable for millions of dollars and held guilty for willful infringement.

Indeed, section 112 was designed to avoid the very result that occurred in this case. Respondent's patent document is defective because it fails to define the key term "dimension," which is referenced in the dispositive term "stable." Petitioners endeavored to construe the patent claim terms in good faith, based on a careful reading of the entire patent and other publicly available information in light of their understanding of how these technical terms are customarily used in the art. In reliance on their good faith conclusion that "dimension" must refer to volume, petitioners were confident that their iodide-removal process did not infringe respondent's patent. The courts below concluded otherwise, based on self-serving testimony of the inventor that was wholly unavailable to petitioners, who only had the patent document itself and their knowledge of the state of the art to rely on. The inventor testimony was critical because under the objective evidence, petitioners' interpretation of the patent and respondent's interpretation were both plausible. Thus, despite the fact that petitioners' interpretation of the patent was reasonable in light of the

evidence available to them, they were found liable for infringement and were required to pay substantial royalties, including enhanced damages, and change their iodide-removal process. This case thus provides a compelling vehicle for the Court to complete the process begun in *Markman* and extended in *Hilton Davis, viz.*, to formulate both procedural and substantive rules of claim construction that will effectively promote the goal of greater certainty in patent law.

2. It is critical that the Court review this question now, and not await further "percolation" in the lower federal courts. The Federal Circuit's exclusive appellate jurisdiction of all patent infringement cases nationwide, 28 U.S.C. § 1295(a)(1), gives special significance for *certiorari* purposes to disagreements and inconsistencies among panels of that court. This Court's grant of the petitions in *Markman* and *Hilton Davis* is indicative of that special significance. See also *Cardinal Chem. Co.* v. *Morton Int'l, Inc.*, 508 U.S. 83, 89 (1993) ("Because the Federal Circuit has exclusive jurisdiction over appeals from all United States District Courts in patent litigation, the rule that it applied . . . is a matter of special importance to the entire Nation. We therefore granted certiorari").

Prompt review is also important because the inconsistent approaches taken by panels of the Federal Circuit create uncertainty among district courts and litigants as to whether inventor testimony can be considered as part of the claim interpretation process. The decision below also threatens the predictability of the patent system as a whole, as innovators do not know whether they can rely on the patent documents to ascertain the scope of prior claimed inventions, or whether they must try to anticipate inventor testimony that could broaden the scope of the prior patents. Finally, the Federal Circuit's inconsistency on this issue will lead to disparate outcomes in similar cases, which is fundamentally unfair to

litigants who cannot control which panel of the court hears their appeal. Such disuniformity will continue and recur unless this Court grants review.

II. THE FEDERAL CIRCUIT'S FAILURE TO CONSIDER THE DOCTRINE OF EQUIVALENTS ISSUE REQUIRES THIS CASE TO BE HELD PENDING THIS COURT'S DECISION IN *HILTON DAVIS*.

In *Hilton Davis,* this Court will address the scope and nature of the cause of action for patent infringement under the doctrine of equivalents. Indeed, the petitioners in *Hilton Davis* are asking this Court to hold that any such cause of action is fundamentally incompatible with the 1952 Patent Act, and therefore should be abandoned altogether. See Brief for Petitioner at 41-49, *Warner-Jenkinson Co.* v. *Hilton Davis Chem. Co.*, No. 95-728, *cert. granted,* 116 S. Ct. 1014 (Feb. 26, 1996). That is, the petitioners in *Hilton Davis* are asking this Court to hold that the only theory of recovery consistent with the Patent Act is literal infringement.

In the alternative, the petitioners in *Hilton Davis* are asking the court to establish narrow legal standards for the application of the doctrine of equivalents. See *id.* at 31-41. Finally, another question posed in *Hilton Davis* is whether the doctrine of equivalents is an issue of fact to be decided by the jury, or an equitable remedy to be considered by the court in select cases. See 62 F.3d at 1516, 1522-23 (holding that "infringement under the doctrine of equivalents is an issue of fact to be submitted to the jury").

The court of appeals completely ducked the equivalents issue in this case solely on the basis that the motion for directed verdict failed specifically to object to the verdict of infringement on the separate equivalents issue. That holding is suspect on its own,[8] but it misses the

[8] Prior to its decision here, the Federal Circuit recognized that a motion for directed verdict of noninfringement necessarily en-

fundamental issue in this case, which is whether the doctrine of equivalents is a valid legal basis for upholding the jury's verdict of infringement in this case. That issue does not turn on the sufficiency of the evidence to go to the jury, which might be waived by an inexact motion for directed verdict, but is instead a purely legal question that is both squarely preserved and will be directly affected by the Court's disposition of *Hilton Davis*. If the doctrine of equivalents is abolished, significantly narrowed, or deemed to be an equitable remedy to be decided by the court, then it cannot serve as a valid legal basis for upholding the jury verdict of infringement in this case. If the jury never should have addressed the issue, or should have addressed it under a different legal standard, then the verdict of infringement can be sustained, if at all, under the theory of literal infringement.

It is therefore plain that this Court's treatment of the doctrine of equivalents in *Hilton Davis* carries with it a substantial likelihood of affecting the proper disposition of this second question. Moreover, the Court's handling of the issue and its decision concerning the proper role of notice in patent law in general will significantly affect the proper approach to take with respect to the first question. Accordingly, the prudent course for the Court to follow at this juncture is to hold the petition until after *Hilton Davis* is decided and then dispose of the case as appropriate in light of that decision.

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compasses both literal infringement and infringement under the doctrine of equivalents. *Malta* v. *Schulmerich Carillons, Inc.*, 952 F.2d 1320, 1324-25 (Fed. Cir. 1991) (defendant's oral motion for directed verdict "on the issue of noninfringement" "no doubt" supported the defendant's motion for JNOV of noninfringement under the doctrine of equivalents), *cert. denied*, 504 U.S. 974 (1992). Moreover, *Malta* comports with the universal recognition under existing patent law that the term "infringement" refers to both literal infringement and infringement under the doctrine of equivalents.

At that point the Court either could grant the petition to decide the substantive elements of claim construction posed in the first question or remand to allow the court of appeals to review the case in light of the Court's analysis of the validity of the doctrine of equivalents, the trial court's proper role in it, and the correct legal standards to be applied. Either way, the proper disposition of this petition will be enhanced significantly if the Court's decision is informed by the teachings of *Hilton Davis*.

CONCLUSION

The petition for Writ of Certiorari should be held pending the disposition of *Hilton Davis* and then decided as appropriate in light of that decision, or alternatively, the Court should grant the petition.

Respectfully submitted,

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June 17, 1996

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APPENDICES

APPENDIX A

UNITED STATES COURT OF APPEALS
FEDERAL CIRCUIT

No. 94-1472

HOECHST CELANESE CORPORATION,
Plaintiff-Appellee,
v.

BP CHEMICALS LIMITED and
STERLING CHEMICALS, INC.,
Defendants-Appellants.

Appealed from U.S. District Court
for the Southern District of Texas (Galveston)
Samuel B. Kent, Judge

March 19, 1996

Before PAULINE NEWMAN, CLEVENGER, and RADER, Circuit Judges.

PAULINE NEWMAN, Circuit Judge.

BP Chemicals Limited and Sterling Chemicals, Inc. (together "BP") appeal the judgment of the United States District Court for the Southern District of Texas,[1]

[1] *Hoechst Celanese Corp. v. BP Chemicals, Ltd.*, 846 F.Supp. 542, 31 USPQ2d 1825 (S.D.Tex. 1994).

entered on the jury verdict that BP had infringed, willfully, United States Patent No. 4,615,806 (the '806 patent) owned by Hoechst Celanese Corporation (herein "Celanese"). On re-determination of the issues of claim interpretation, as mandated by *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 34 USPQ2d 1321 (Fed. Cir.) (*en banc*), *cert. granted*, —— U.S. ——, 116 S.Ct. 40, 132 L.Ed.2d 921 (1995), and on review of the other issues on appeal, the judgment is affirmed.

I

INFRINGEMENT

A. The Invention

The '806 patent, inventor Dr. Charles B. Hilton, is directed to a method of reducing iodide contamination in organic medium, particularly acetic acid. When the acetic acid is catalytically converted to vinyl acetate, the presence of iodide in more than about one part per billion poisons the catalyst. Such iodide contamination was known to be removable by contacting the acetic acid with silver-charged gel ion exchange resins, but the process was slow and impractical in large commercial volume. In seeking to improve the Celanese commercial process, Dr. Hilton discovered that by using a macroreticulated (sometimes described as macroporous) silver-charged cation exchange resin having specified characteristics, he obtained effective, rapid, large-volume removal of minute traces of iodine, to a degree of effectiveness, practicality, and utility not previously available.

When BP encountered iodide contamination in the commercial production of acetic acid BP sought other methods of removal before adopting the method, using a macroreticulated silver-charged cation exchange resin, that is charged with infringement. Celanese brought suit, asserting that the BP method infringed claims 2 and 6

of the '806 patent. Claim 2 is shown, with claim 1 from which it depends:

> 1. A method for removing iodide compounds from a non-aqueous organic medium comprising contacting the medium containing said iodide compounds with an ion exchange resin characterized in that the resin is a macroreticulated strong-acid cation exchange resin which is stable in the organic medium and has at least one percent of its active sites converted to the silver or mercury form.
>
> 2. The method of claim 1 wherein the non-aqueous organic medium is acetic acid and from about 25 to about 75 percent of the active sites are in the silver form.

The question of infringement turns on the meaning of the word "stable" in the claims. It is no longer disputed that all of the other claim elements and limitations are present in the BP method.

B. Review Procedure

Trial was to a jury, lasting for seven days. The jury found that the '806 patent was infringed and that the infringement was willful. The district court, denying duly made motions for a new trial and for judgment as a matter of law, entered judgment on the jury verdict. In its opinion the court identified the evidence in support of the jury verdict, identified the evidence supporting each party's theory of the meaning of certain disputed terms in the patent, and stated its own view of the meaning of these terms. In following this procedure the court relied on *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 822 n. 3, 23 USPQ2d 1426, 1432 n. 3 (Fed.Cir. 1992), as requiring or advising that a judicial statement be made of the meaning of disputed claim terms.

BP points out that *Read v. Portec* has been superseded by the decision in *Markman v. Westview Instru-*

ments, Inc., 52 F.3d 967, 34 USPQ2d 1321 (Fed.Cir.) (*en banc*), *cert. granted*, —— U.S. ——, 116 S.Ct. 40, 132 L.Ed.2d 921 (1995), and that *Markman* requires the Federal Circuit to decide *de novo* disputed questions of claim interpretation without deference to the trier of fact. BP points out that the disputed question of the meaning of the claim term "stable" is dispositive of the issue of infringement, and therefore that no deference need be given to the jury's finding of infringement. We agree that *Markman* so requires, and that the issue of infringement is decided by the meaning of "stable" as used in the claims. *See Markman*, 52 F.3d at 999, 34 USPQ2d at 1346 (Pauline Newman, J., dissenting) (pointing out that the disputed meaning of technical terms often decides the fact of infringement).

"Stable" is defined in the body of the specification as turning on the meaning of "dimension." Although "dimension" appears in the specification, not in the claims, implementation of the *Markman* decision appears to require that the meaning of "dimension" be given the same *de novo* determination by the Federal Circuit as the meaning of "stable" in the claims, lest we add further complexities to the trial of patent cases.

C. Construction of the Terms "Stable" and "Dimension"

A technical term used in a patent document is interpreted as having the meaning that it would be given by persons experienced in the field of invention, unless it is apparent from the patent and the prosecution history that the inventor used the term with a different meaning. *ZMI Corp. v. Cardiac Resuscitator Corp.*, 844 F.2d 1576, 1579, 6 USPQ2d 1557, 1560 (Fed.Cir.1988); *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1387, 21 USPQ2d 1383, 1386 (Fed.Cir.1992).

The meaning of "stable" as used in the claims is defined in the specification, col. 4, lines 31-35, as follows:

> By the term "stable," it is meant that the resin will not chemically decompose, or change more than about 50 percent of its dry physical dimension upon being exposed to the organic medium containing the iodide compounds.

Thus the meaning of "stable" depends on the meaning of "dry physical dimension." On the BP position that "dry physical dimension" refers to volume, the BP process does not infringe; but on the Celanese position that "dimension" is a linear measure, there is literal infringement. Celanese states that linear dimension is the plain meaning of "dimension" as understood by persons of skill in this field and as used by the inventor. The BP position is that the term "stable" refers to volume as the physical dimension being measured, pointing out that the resin is in the shape of spherical beads and that the inventor in his research measured volume change. BP states that since its resin changes by more than 50% in volume when exposed to acetic acid, there can not be infringement.

The parties have provided us with photographs and experimental data, the testimony of the scientists who produced the data and interpreted it, and the testimony of experts in the field. *Markman* limits appellate reliance on extrinsic evidence to evidence in explanation of the technology and technical terms:

> Through this process of construing claims by, among other things, using certain extrinsic evidence that the court finds helpful and rejecting other evidence as unhelpful, and resolving disputes *en route* to pronouncing the meaning of claim language as a matter of law based on the patent documents themselves, the court is not crediting certain evidence over other evidence or making factual evidentiary findings. Rather, the court is looking to the extrinsic evidence to assist in its construction of the written document, a task it is required to perform.

52 F.3d at 981, 34 USPQ2d at 1331. However, we have found it necessary to rely on the evidence presented at the trial and credit certain evidence over other evidence, for we are not personally qualified to know the scientific meanings of "stable" and "dimension" as applied to macroreticulated cation-exchange resins in organic medium.

The evidence was sharply in conflict. The technical expert presented by Celanese testified as follows:

> Q. The second part of this has to do with its dimension. What does that mean?
>
> A. For the case of a spherical resin, it typically means its diameter.
>
> Q. The word "dimension," does it mean volume dimension?
>
> A. There is no such thing as volume dimension.

In turn, the BP expert testified that "dimension" meant volume dimension, stating that volume is what one skilled in the art would understand the term to mean:

> Q. Okay. Is that all the reasons [why you believe the term "stable" refers to volume]?
>
> A. There are at least two, perhaps three, additional very important reasons. One is that really it is the common practice of measuring changes that a resin experiences as it swells in a solvent in terms of volume percentage swelling. That is very amply documented in the literature. It is the easiest thing to do. Conversely, it is rather difficult to pick a single bead, measure the change in diameter of that bead, for example, because not every one bead in a sample of resin is identical to the rest of the beads. . . .
>
> . . . .
>
> The other rather important reason is that it is clearly the objective of this patent to distinguish between a

> resin that works because it has a porosity independent of swelling, such as Amberlyst 15, and another type of resin which has a porosity that depends upon swelling. That would be the gel type resin in the language used by the patent.

Both sides cite dictionary definitions that support their respective positions. *Webster's Ninth New Collegiate Dictionary* at 355 (1988) defines "dimension" as:

> measure in one direction; *specif.* one of three coordinates determining a position in space or four coordinates determining a position in space and time.

In partial contrast, the *Concise Oxford Dictionary of Current English* at 327 (8th ed.1990) defines "dimension" as:

> a measureable extent of any kind, as length, breadth, depth, area, and volume.

This court has occasionally relied on general and technical dictionaries to determine the meaning of technical and other terms. In this case the dictionaries do not distinguish in a dispositive manner between the contested technical meanings. Further, a general dictionary definition is secondary to the specific meaning of a technical term as it is used and understood in a particular technical field. *See Hormone Research Found., Inc. v. Genentech, Inc.*, 904 F.2d 1558, 1563, 15 USPQ2d 1039, 1043-44 (Fed.Cir.1990), *cert. dismissed*, 499 U.S. 955, 111 S.Ct. 1434, 113 L.Ed.2d 485 (1991). Thus we return to the testimony at trial.

Dr. Hilton, the inventor, testified under direct examination as follows:

> Q. What is meant by that sentence? In other words, how much swelling does that definition of stable accommodate?
>
> A. A 50 percent change in dimension. The dimension is a distance. A dimension is not volume.

> Okay? It's the distance between my hands, or it's the distance across my chest. It's the radius of a sphere. A dimensional change in a spherical particle of 50 percent would lead to a swelling or a volume increase of 337 percent.

Dr. Hilton was challenged as to his assertion that "dimension" means distance or linear dimension, for he had measured the swelling volume of these resins during his research. The following exchange occurred on cross-examination:

> Q. When did you first form a view that dimension means something other than volume dimension, dimension in this definition of stable?
>
> A. I have never thought of volume as being a dimension. Dimension is not—volume is not a dimension. Volume of a sphere formula, four thirds pi, disance cubed, radius cubed, distance times distance times distance. Dimension is a distance.
>
> Q. You've never head the term "volume" used as a dimension?
>
> A. No.
>
> Q. Yet you consider the volume expansion in order to design a guard bed, do you not?
>
> A. Yes, you do.
>
> Q. How many dimensions does volume have?
>
> A. Volume has three dimensions.

The district court called Dr. Hilton's testimony "highly credible." Although we are at a disadavntage in attempting to make credibility determinations, the inventor's testimony reads as that of an expert in the field. *See Palumbo v. Don-Joy Co.*, 762 F.2d 969, 976, 226 USPQ 5, 9 (Fed.Cir.1985) (concluding that particular inventor's declaration as to claim meaning was by a "knowledgeable declarant"), *overruled on other grounds,*

Markman, 52 F.3d at 979, 34 USPQ2d at 1329. *Markman* requires us to give no deference to the testimony of the inventor about the meaning of the claims. *Id.* at 983, 52 F.3d 967, 34 USPQ2d at 1332. However, we have treated Dr. Hilton's testimony as cumulative to the other evidence, and as enlarging our understanding of the technology and the usuage of the disputed terms.

In addition, the specification of the '806 patent shows the resin characteristic of mesh size of the dry resin, a linear measure based on diameter. The specification also contains swelling data stated to be from the Technical Bulletin for Amberlyst® 15 and which, according to the inventor's testimony, is the percentage of swelling by volume. A videotaped "swelling test" that was presented to the jury is stated to have shown that Celanese's preferred Amberlyst® 15 resin expanded slightly more than 50% by volume in acetic acid, while BP's Purolite® resin of the same chemical composition (polystyrene cross-linked with divinylbenzene) expanded 103% by volume but less than 50% in linear dimension upon exposure to acetic acid.

The district court observed that BP's interpretation of "stable" as meaning dimension by volume would exclude from the claims the Celanese preferred embodiment that is described in the specification. However, if stable is measured by linear dimension, the claims include the resin that Celanese specifies in its invention. We share the district court's view that it is unlikely that an inventor would define the invention in a way that excluded the preferred embodiment, or that persons of skill in this field would read the specification in such a way. *See Modine Mfg. Co. v. United States Int'l Trade Comm'n*, 75 F.3d 1545, 1550, 37 USPQ2d 1609, 1612 (Fed.Cir. 1996) (claim interpretation that would exclude the inventor's device is rarely the correct interpretation).

We find that the more reasonable explanation is that volume has three dimensions, and we give weight to the

argument that on the BP definition the Celanese preferred embodiment would not be within the claims of the Celanese patent. Thus we conclude that "dry physical dimension" as used in the specification means linear dimension. On this definition of dimension, and defining "stable" accordingly, the claims read literally on the BP process.

D. The Issue of Equivalency

Since this case was tried before *Markman* was decided, the jury was instructed to interpret these disputed terms en route to its verdict on the issue of infringement. We thus turn to the jury trial, in the interest of complete review at this time.

BP argues that a new trial is required because the jury was not asked to distinguish between literal infringement and infringement by equivalency. BP states that because it is possible that the jury relied on an inapplicable theory of infringement, the verdict must be discarded.

Celanese had proposed the submission to the jury of separate questions on literal infringement and infringement by equivalency, while BP did not propose separate questions. The judge selected the BP form of verdict. The specificity of the verdict is within the discretion of the trial judge. *Allen Organ Co. v. Kimball Int'l, Inc.*, 839 F.2d 1556, 1561, 5 USPQ2d 1769, 1773 (Fed.Cir.) ("District courts have broad discretion in the conduct of jury trials, including the form of the jury verdict."), *cert. denied*, 488 U.S. 850, 109 S.Ct. 132, 102 L.Ed.2d 104 (1988). BP concedes that it had proposed the form of the verdict that was used, and states that the reason it did not propose a separate question on equivalency was because of its position that equivalency was an equitable matter and not for the jury. However, BP was fully apprised that the jury was instructed on infringement by equivalency, and that the issue had been presented by witnesses at trial. Further, BP's position was not the law

at the time of trial, nor is it now. *Hilton Davis Chem. Co. v. Warner-Jenkinson Co.*, 62 F.3d 1512, 35 USPQ2d 1641 (Fed.Cir.1995) (*en banc*).

BP by its acquiescence in and indeed by its proposal of the verdict form waived objection to the verdict form. *See* Fed.R.Civ.P. 51; *Allen Organ*, 839 F.2d at 1562, 5 USPQ2d at 1774 (applying the general rule that a party will be deemed to have waived objection to possible inconsistencies in the jury verdict if it failed to raise such objection before the jury was discharged); *Matthews v. Ohio Barge Line, Inc.*, 842 F.2d 202, 206 (5th Cir. 1984) (failure to object to absence of separate interrogatories at trial precludes raising the issue on appeal). Although in egregious circumstances acquiescence in erroneous instructions may not be immune from remedy, *see Fruge v. Penrod Drilling Co.*, 918 F.2d 1163, 1169 (5th Cir.1990) ("Plain error requires that plaintiff establish the challenged instruction was an incorrect statement of the law and was probably responsible for an incorrect verdict, leading to substantial injustice."); *American Hoist & Derrick Co. v. Sowa & Sons, Inc.*, 725 F.2d 1350, 1364, 220 USPQ 763, 774 (Fed.Cir.1984), in this case the instructions were not in error. Thus there is no basis for BP's objection now raised.

BP also argues that the issue of equivalency should not have been given to the jury because Celanese did not present sufficient evidence of equivalency. Celanese states that this purported insufficiency of the evidence was not raised at trial, either by motion for directed verdict or by request for jury instruction or in any other way before the case went to the jury. A party may not challenge a verdict in a post-trial motion for judgment as a matter of law absent a properly made motion for a directed verdict at the close of all the evidence. Fed.R. Civ.P.50(b); *Hinojosa v. City of Terrell, Tex.*, 834 F.2d 1223, 1227-28 (5th Cir.1988) ("[A] party may only base a motion for judgment notwithstanding the verdict

on a ground that he included a prior motion for directed verdict at the close of all the evidence.") (collecting cases); *Delta-X Corp. v. Baker Hughes Prod. Tools, Inc.*, 984 F.2d 410, 412, 25 USPQ2d 1447, 1449 (Fed.Cir. 1993) (interpreting Fifth Circuit law).

BP's directed verdict motion did not address the issue of equivalency or the sufficiency of the evidence to show equivalency, BP arguing only that there was no infringement of the "stable" limitation based on the "dimension" definition. BP argued in its motion for judgment as a matter of law that Celanese's electron micrographic evidence, showing a macroreticulated structure for both Amberlyst® 15 (used by Celanese) and Purolite® (used by BP) resin, was not sufficient to prove similarity of the "way" the resin worked. Celanese states that BP's silence or inadequate objection, in its directed verdict motion, to the now-asserted deficiency in Celanese's proofs, deprived Celanese of the opportunity to cure any such deficiency before the case was submitted to the jury.

Providing the opportunity to the nonmovant to repair gaps in its proofs is the reason Rule 50(b) is rigorously applied. *See generally Cone v. West Virginia Pulp & Paper Co.*, 330 U.S. 212, 67 S.Ct. 752, 91 L.Ed. 849 (1947) (discussing the opportunities pursuant to Rule 50(b) for litigants and trial judge to correct errors before appeal is taken). BP disputes Celanese's view of the content of BP's motions, stating that it moved and filed a supporting memorandum for directed verdict after plaintiff's case and at the close of the evidence, pointing out the inadequacies of the evidence. Our review of BP's memorandum in support of its motion for directed verdict detects no mention of the doctrine of equivalents; the memorandum focuses entirely on the meaning of "stable."

As we have discussed, on the correct claim interpretation the claims are literally infringed. This jury's verdict of infringement is consistent with our ruling based on claim interpretation. In addition, the district court re-

viewed the evidence, referred to the insubstantial nature of BP's variation of the patented process, and stated that the verdict of infringement was "overwhelmingly supported by the evidence." On review of the entirety of the proceeding, we have not been shown grounds for reversal or for a new trial. *See Shatterproof Glass Corp. v. Libbey-Owens Ford Co.*, 758 F.2d 613, 225 USPQ 634 (Fed. Cir.), *cert. dismissed*, 474 U.S. 976, 106 S.Ct. 340, 88 L.Ed.2d 326 (1985).

E. BP's Separate Patent on its Process

BP directs our attention to its "Jones patent," U.S. Patent No. 5,003,104, and asks that we take judicial notice that BP is practicing a process that is separately patentable, arguing that this is presumptive evidence of non-infringement.

BP's Jones patent was not introduced at trial, Celanese says intentionally because it showed that the Purolite® resin used by BP was "likely macroreticulated," an issue that was contested at trial although not on appeal. As the district court remarked, a reasonable jury could have discredited the BP tests wherein the pores of the resin were first collapsed by high heat or a drying process, evidence that the district court called "extremely dubious." Although there is much argument on this point on appeal, we decline to consider disputed evidence that could have been but was not offered at trial. Indeed, the proposition for which it is offered is incorrect. *See Atlas Powder Co. v. E.I. du Pont De Nemours & Co.*, 750 F.2d 1569, 1580, 224 USPQ 409, 417 (Fed.Cir.1984) (an improvement in a step of a patented method, even if separately patentable, may not avoid infringement). *See also National Presto Indus., Inc. v. West Bend Co.*, 76 F.3d 1185, 1192, 37 USPQ2d 1685, 1689 (Fed.Cir.1996) (the fact of separate patentability is relevant and should be weighed, but is not dispositive of noninfringement).

The fact of separate patentability presents no legal or evidentiary presumption of noninfringement and, in this

case, does not outweigh the substantial evidence supporting the jury verdict of infringement.

Conclusion

On the correct interpretation of "stable" as measured by linear dimension, the claims read on the accused method. Alternatively, there was substantial evidence whereby a reasonable jury could have found infringement. The judgment of infringement is affirmed.

II

WILLFUL INFRINGEMENT

BP argues that the jury verdict of willful infringement should be reversed, asserting that the question of infringement was a close one, and thus can not be deemed willful as a matter of law.

The issue of willfulness of wrongdoing is a question of fact, and was presented to the jury for decision. On appellate review of the jury verdict, if there was substantial evidence in support of the verdict it is not subject to reversal on appeal. *See Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1581, 1 USPQ2d 1081, 1091 (Fed.Cir.1986).

The issue of "willful" infringement measures the infringing behavior, in the circumstances in which the infringer acted, against an objective standard of reasonable commercial behavior in the same circumstances. Willful infringement is thus a measure of reasonable commercial behavior in the context of the tort of patent infringement. The extent to which the infringer disregarded the property rights of the patentee, the deliberateness of the tortious acts, or other manifestations of unethical or injurious commercial conduct, may provide grounds for a finding of willful infringement and the enhancement of damages. *Amsted Indus. Inc. v. Buckeye Steel Castings Co.*, 24 F.3d 178, 181 30 USPQ2d 1462, 1464 (Fed.Cir.1994).

See American Medical Sys., Inc. v. Medical Eng. Corp., 6 F.3d 1523, 1531, 28 USPQ2d 1321, 1326 (Fed.Cir. 1993) (determining whether infringer had a "reasonable good faith belief" in noninfringement); *State Indus., Inc. v. Mor-Flo Indus., Inc.*, 883 F.2d 1573, 1581, 12 USPQ2d 1026, 1032 (Fed.Cir.1989) ("copying is evidence of willful infringement"), *cert. denied*, 493 U.S. 1022, 110 S.Ct. 725, 107 L.Ed.2d 744 (1990).

The jury was instructed as follows:

> Willful infringement is established where Celanese has proven that BP and Sterling (i) were aware of Celanese's patent; and (ii) had no reasonable basis for reaching a good faith conclusion that using their method avoided infringement of the patent. Infringement is not willful and deliberate if the party found to be infringing had a reasonable basis to believe that the patent is invalid or not infringed.
>
> You may find that BP and Sterling willfully infringed the '806 patent if you find, by clear and convincing evidence, that BP and Sterling failed to exercise due care to determine whether or not they were infringing the patent, after they had actual notice of the patent.

BP does not assert error in the instruction, and we discern none. However, BP argues that the verdict is not supported by substantial evidence, pointing to its own evidence and the comments by the trial judge that the case was a close one. *See Sun Studs, Inc. v. ATA Equipment Leasing, Inc.*, 872 F.2d 978, 10 USPQ2d 1338 (Fed.Cir.1989) (reviewing to determine whether jury verdict is supported by substantial evidence on the record as a whole), *overruled as to laches, A.C. Aukerman Co. v. R.L. Chaides Const. Co.*, 960 F.2d 1020, 1038, 22 USPQ2d 1321, 1333 (Fed.Cir.1992) (*en banc*).

There was evidence that BP conducted research in an effort to avoid the Celanese process, and that BP turned

to the process that was found to be infringing only after failing to find some other solution to the problem of iodide contamination. BP argues that infringement that is not literal, but is found only by equivalency, can not be willful for it shows BP's good faith effort to avoid the patent. Such facts when present are of course relevant, but it is not a rule of law that infringement that is not literal can never be sufficiently culpable to warrant enhanced damages. Although avoidance of literal infringement is a fact to be considered and weighed, along with other relevant facts, it is not an automatic exculpation. And in this case, as we have discussed, the infringement is literal.

BP requested reexamination of the Celanese patent six months before trial. The district court declined to stay the trial, and the proceedings went forward concurrently. This procedure was fully within the court's discretion, lest the trial schedule be manipulated or unduly delayed. However, BP also argues that the acceptance by the patent examiner of the reexamination request was evidence of the closeness of the question and supports the position that infringement was not willful.

We take notice that the grant by the examiner of a request for reexamination is not probative of unpatentability. The grant of a request for reexamination, although surely evidence that the criterion for reexamination has been met (*i.e.*, that a "substantial new question of patentability" has been raised, 35 U.S.C. § 303), does not establish a likelihood of patent invalidity.[2] *See Acoustical Design, Inc. v. Control Elecs. Co.*, 932 F.2d 939, 942, 18 USPQ2d 1707, 1710 (Fed.Cir.) ("initial rejection by the Patent and Trademark Office of original claims that later were confirmed on reexamination hardly

[2] The Annual Report of the Patent and Trademark Office for 1994 states that 89% of the reexamination requests were granted that year, but only 5.6% of the reexamined patents were completely rejected with no claims remaining after reexamination.

justifies a good faith belief in the invalidity of the claims"), *cert. denied*, 502 U.S. 863, 112 S.Ct. 185, 116 L.Ed.2d 146 (1991).

The issue of willful infringement was thoroughly argued to the jury, whose determination must be upheld if any set of facts supported by substantial evidence is capable of sustaining the verdict. *Orthokinetics*, 806 F.2d at 1580, 1 USPQ2d at 1091. Although we do not know whether the jury's finding of infringement was based on literal infringement or on equivalency, on the entirety of the record there was substantial evidence whereby a reasonable jury could have found willfulness. The verdict must be sustained.

III

SANCTIONS

Celanese asserts that BP's appeal is frivolous, and requests the imposition of sanctions.

BP's appeal was taken as of right, on disputed and technologically complex facts. Although a jury verdict warrants deference on appeal, in light of this court's conflicting holdings, now resolved in *Markman*, that issues of claim interpretation in infringement actions must be decided *de novo* on appeal, a losing party having a colorable argument can not be faulted for seeking appellate attention after a jury trial. Although we have affirmed the district court's judgment, BP's arguments on the merits are clearly not frivolous. Unwarranted accusations of frivolousness, and the satellite litigation generated by unsupported requests for sanctions, are no less burdensome to the court and the parties than are authentically frivolous appeals.

AFFIRMED.

APPENDIX B

UNITED STATES DISTRICT COURT
S.D. TEXAS
GALVESTON DIVISION

Civ. A. No. G-93-001

HOECHST CELANESE CORPORATION

v.

BP CHEMICALS LIMITED and
STERLING CHEMICALS, INC.

March 8, 1994

FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDER ON POST-VERDICT MOTIONS

KENT, District Judge.

This action came to trial on January 10, 1994, before the Court and a jury. The jury returned a verdict, finding that Defendants BP Chemicals and Sterling Chemicals had infringed U.S. Patent No. 4,615,806 (the '806 patent), owned by Plaintiff Celanese; that such infringement was willful; that the '806 patent was not obvious; that the application for the '806 patent did not fail to disclose the inventors' best mode of practicing the invention, or the identity of co-inventors; and that a reasonable royalty for the use of the invention was six-tenths of one cent per pound of acetic acid produced with the infringing pro-

cess. Before the Court are the Defendants' motions for judgment as a matter of law and judgment on the issue of inequitable conduct, and Plaintiff's motions for judgment on the verdict, enhanced damages, permanent injunction, pre-judgment interest, costs, and attorney's fees. To the extent these motions raise issues of fact to be decided by the Court, the following opinion embodies the Court's findings of fact as well as its conclusions of law.

I. Background

As described in its abstract, the '806 patent generally relates to a method for removing iodide compounds from a non-aqueous organic medium, such as acetic acid, whereby the medium is contacted with a macroreticulated strong-acid cation exchange resin which is stable in the organic medium and has at least one percent of its active sites converted to the silver or mercury form. In particular, the patent covers a process for removing iodides from acetic acid by passing the acid over a "guard bed" of resin beads which have been "charged" with silver. The patent discloses that the preferred resin for the invention is a specific commercially-available product sold by Rohm & Haas under the trademark "Amberlyst 15."

For a stipulated 18-month period in 1992 and 1993, the Defendants produced a stipulated quantity of acetic acid—931,923,636 pounds—by utilizing a guard bed with nearly identical properties and purposes as that described in the '806 patent. The only distinguishing aspect of the Defendants' process was that the Defendants' guard bed used, rather than Amberlyst 15, a commercially-available resin called "Purolite C-145." At trial, the Defendants contended that the use of Purolite C-145 is not claimed by the '806 patent.

II. Judgment N.O.V.

A. Infringement

The process claimed by the '806 patent requires a "macroreticulated" strong-acid exchange resin which is "stable" in the organic medium. The Defendants contend that no substantial evidence supports the jury's finding that Purolite C-145 is either macroreticulated or stable, as defined in the '806 patent. Accordingly, the Defendants argue that their process cannot infringe the patent as a matter of law.

To prevail on a motion for judgment notwithstanding the verdict, a party must show (1) that reasonable persons, in light of the evidence before them, could not have found the facts necessary to support the jury's verdict; or (2) that the facts properly found cannot in law support that verdict. *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 821 (Fed.Cir.1992). In reviewing factual findings, the Court must consider all of the evidence, in the light most favorable to the non-movant, drawing reasonable inferences, without simply substituting its choice for that of the jury between conflicting elements in the evidence. *Dana Corp. v. IPC Ltd. Partnership*, 860 F.2d 415, 417 (Fed.Cir. 1988), *cert. denied*, 490 U.S. 1067, 109 S.Ct. 2068, 104 L.Ed.2d 633 (1989). In reviewing the legal conclusions implicit in the verdict, the Court should review *de novo* the legal issues supporting the verdict. *Read Corp.*, 970 F.2d at 821.

At trial, the Defendants presented evidence supporting a colorable argument that the '806 patent defines "macroreticulated" in a manner which excludes the Purolite resin. The patent specification defines macroreticulated resins as the "non-gel-type," and further defines gel-type resins as those which depend on swelling for their porosity. Although the Defendants presented no evidence that anyone knowledgeable in the field of resins would call Purolite C-145 a "gel-type" resin, the Defendants nonetheless

argue that the patent's definition of this term of art excludes C-145 because some evidence showed that this resin depends on swelling for its porosity.

The jury properly rejected such an overly strained interpretation of the claims of the '806 patent, as the evidence overwhelmingly supported a contrary conclusion. Purolite itself describes its product as "macroporous," a term which the vice-president of Purolite (among others) testified is synonymous with "macroreticulated." The evidence showed that, unlike gel-type resins, C-145 is made with a porogen and, in fact, has substantial porosity when compared to gel-type resins. In contrast, Defendants' evidence that C-145 is not macroreticulated, as defined in the '806 patent, appeared exceedingly dubious. Accordingly, the Court finds that the jury properly applied the evidence to the correct interpretation of the '806 patent in finding that Purolite C-145 is a macroreticulated resin, both as defined in the patent and as defined generally by scientists in the resin field.

In contending that Purolite C-145 is not "stable" as defined in the '806 patent, the Defendants attack the jury's finding on a much closer issue. The '806 patent specification partially defines a "stable" resin as one which will not change more than about 50 percent of its dry physical dimension upon being exposed to an organic medium, such as acetic acid. The Defendants contend that this specification must refer to the resin's *volume* change. When exposed to acetic acid, Purolite C-145 swells with a volumetric increase of slightly more than 100%. Therefore, by the Defendant's interpretation, C-145 is outside the strict limitations of the resin described in the '806 patent. Celanese, on the other hand, argued that the 50% figure refers to the *linear* dimension of the resin beads; by this measure, C-145 is well within the literal terms of the patent.

At trial, the Defendants pointed to substantial circumstantial evidence in favor of their interpretation, such

as the inventor's testimony that he had always measured the swelling of resins in terms of volume, not linear dimension. Celanese, however, countered with expert testimony that the word "dimension" does not describe a "volume" measurement; evidence that a limitation of 50% volume swelling would lead to the improbable result that the patent's own "best mode" resin—Amberlyst 15—is excluded from the scope of the patent; and evidence that resin beads are commonly measured by their diameter. Therefore, substantial evidence supports a conclusion that Purolite C-145 is "stable" within the literal meaning of the '806 patent.

Moreover, the jury could permissibly have found that the Defendants' use of Purolite C-145 infringed the '806 patent *even if* they believed that the stability requirement referred to volumetric changes. Under the doctrine of equivalents, a process infringes a patent, even if each limitation of the patent's claim is not literally found in the accused process, if the accused process performs substantially the same function as that of the patented process, by substantially the same means, to achieve substantially the same result. *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 608, 70 S.Ct. 854, 856, 94 L.Ed. 1097 (1950). This standard perfectly describes the minimum relationship between the accused and patented processes at issue here.

The evidence at trial showed that the volumetric swelling of Purolite C-145 is the only reasonably arguable distinction between the process used by the Defendants and that described in the '806 patent. Otherwise, the Defendants charged this macroretriculated strong-acid exchange resin with silver, and placed it in a guard bed in order to remove iodides from a stream of acetic acid—just as described in the patent. Even if Defendants' resin choice did not literally infringe the '806 patent, the Court cannot envision circumstances which would more clearly qualify for the protection of *Graver:* the Defendants'

process performs the *identical* function of the '806 patent, to achieve *identical* results, by almost (if not literally) the *idential* means. Accordingly, the Court finds the jury's verdict of infringement to be overwhelmingly supported by the evidence.

Alternatively, to the extent this finding is within the exclusive province of the Court, the Court independently finds infringement.[1] To hold otherwise would permit the Defendants "to make unimportant and insubstantial changes and substitutions in the patent which, though adding nothing, would be enough to take the copied matter outside the claim, and hence outside the reach of law." *Graver Tank*, 339 U.S. at 607, 70 S.Ct. at 856.

B. Willfulness

The Defendants stipulated at trial that they were aware of the '806 patent at the time they began using their infringing process. Furthermore, their own testimony established that they knew of the patent when they began trying to develop a means of accomplishing the same result as that achieved by the '806 patent. Finally, the Defendants produced no evidence at trial that they complied with their duty to seek legal advice on the infringement issue before commencing use of their guard bed. This evidence (and lack thereof) is alone sufficient to support the jury's finding that the Defendants willfully infringed the '806 patent, regardless of the Defendants' protests that they had no intention to infringe. *See Kloster Speedsteel AB v. Crucible, Inc.*, 793 F.2d 1565, 1579 (Fed.Cir.), *modified in part*, 231 U.S.P.Q. 160 (Fed.Cir.1986), *cert. denied*, 479 U.S. 1034, 107 S.Ct. 882, 93 L.Ed.2d 836 (1987) (jury entitled to draw ad-

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[1] As both parties note, the issue of whether or not the doctrine of equivalents is properly an issue for the jury or for the Court is currently before the *en banc* Federal Circuit. *Hilton Davis Chem. Co. v. Warner-Jenkinson Co.*, 1993 WL 502162, Appeal No. 93-1088 (Fed.Cir.).

verse inferences from defendant's refusal to produce legal opinions); *L.A. Gear, Inc. v. Thom McAn Shoe Co.*, 988 F.2d 1117, 1126 (Fed.Cir.), *cert. denied*, —— U.S. ——, 114 S.Ct. 291, 126 L.Ed.2d 240 (1993) (same).

C. Validity

A patent is presumed valid. 35 U.S.C. § 282. Nonetheless, the Defendants argue that the jury's findings on the issues of obviousness, best mode, and inventorship were not supported by substantial evidence. With regard to proof of these validity facts, of course, the Defendants' bore the burden at trial of establishing their existence by clear and convincing evidence. *L.A. Gear*, 988 F.2d at 1123. In light of the evidence adduced at trial, the Defendants' request for judgment on these issues is absurd.

Defendants rely primarily on the "Hingorani reference" to support their claim that the subject matter of the '806 patent was obvious in light of the prior art. But the patent examiner considered this very reference before awarding the '806 patent, and evidence of prior art that is cumulative of that considered by the examiner has little probative weight in overcoming the presumption of validity. *See Windsurfing Int'l v. AMF, Inc.*, 782 F.2d 995, 998 (Fed.Cir.), *cert. denied*, 477 U.S. 905, 106 S.Ct. 3275, 91 L.Ed.2d 565 (1986). Furthermore, the evidence easily supports the examiner's implicit conclusion that this reference did not render the claims of the '806 patent obvious. The Hingorani reference described a process which: (1) used a gel-type resin, as opposed to the '806 patent's macroreticulated resin; and (2) accomplished the desired result at a rate thousands of times slower than that achieved by the '806 patent. Hence, the jury's conclusion—that the substantially different and more efficient '806 patent was not obvious to one skilled in the art—is far from clearly erroneous.

The Defendants' also presented evidence of the patent's "subjective obviousness" to the inventor. This, of course, is direct evidence of nothing. *See Ryko Mfg. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed.Cir.1991) (test is not subjective obviousness to inventor, but objective obviousness to artisan).

Finally, the Court properly excluded evidence of preliminary reexamination findings by the patent office as having little or no probative value, and as being overly prejudicial. The Patent Office grants 86% of all requests for reexamination, but only 12% of these grants result in refusals to find patentable claims. *Output Tech. Corp. v. Dataproducts Corp.*, 22 U.S.P.Q.2D 1072, 1074, 1991 WL 332547 (W.D.Wash.1991). Moreover, the evidence before the Patent Office on reexamination is entirely cumulative of that put before the jury at trial.

The jury was also more than justified in rejecting the Defendants' contentions that the inventor of the '806 patent failed to disclose his "best mode" of practicing the invention, or the existence of "co-inventors". The Defendants' best mode argument is largely founded on an incorrect proposition of law, as discussed in this Court's prior order on the Defendants' motion for summary judgment. The inventorship case evinces only desperation. Accordingly, the Defendants' utterly failed to carry their burden of proving the '806 patent invalid.

D. Conclusion

The evidence more than sufficiently supported the verdict of the jury. To the extent relevant findings were within the Court's sole province, the Court completely concurs with the jury's findings and the conclusions they implicate. Therefore, the Defendants' motion for judgment as a matter of law is DENIED.

III. Inequitable Conduct

Defendants also move for judgment on the grounds that the '806 patent is unenforceable due to the inventor's

alleged inequitable conduct in prosecuting the patent. Specifically, the Defendants claim that Celanese violated its duty of candor to the Patent Office by failing to disclose known prior art—referred to at trial as the "Leach Patent" and the "Brittish Application"—and by failing to fairly conduct and disclose experiments which Celanese relied upon to distinguish its invention from the prior art.

A party asserting the unenforceability of a patent based on inequitable conduct must prove by clear and convincing evidence that the applicant both (1) failed to disclose material information to the Patent Office, and (2) thereby intended to deceive the Patent Office. *Speciality Composites v. Cabot Corp.*, 845 F.2d 981, 991 (Fed. Cir.1988); *FMC Corp. v. Manitowoc Co.*, 835 F.2d 1411, 1415 (Fed.Cir.1987). With respect to the prior art references, the Defendants attempted to establish both elements of this defense with unrebutted evidence that: (1) both the inventor and prosecutor of the '806 patent learned of the Leach Patent and the Brittish Application during the prosecution of the '806 patent; (2) they both knew that these references were material to the patentability of their claims; and (3) they nonetheless deliberately chose not to disclose these references to the patent examiner.

However, the evidence also clearly established that these papers were less material than, or at most cumulative of, the prior art references which Celanese had already provided to the Patent Office. A patent applicant has no obligation to disclose an otherwise material reference if the reference is cumulative or less material than those already before the examiner. *Halliburton Co. v. Schlumberger Technology Corp.*, 925 F.2d 1435, 1440 (Fed.Cir.1991). Therefore, Celanese's failure to cite these references did not amount to inequitable conduct. *See Rolls-Royce, Ltd. v. GTE Valeron Corp.*, 800 F.2d 1101, 1107 (Fed.Cir.1986).

Defendants' arguments as to the experimental data relied upon by Celanese are equally specious. The inventor's highly credible testimony established that the examples were transcribed from his notebook, where he had recorded the results of experiments conducted in the normal course of determining the advantages of his invention. Even if the comparative data given the Patent Office could have been more complete, the Court finds the evidence devoid of proof of an intent to deceive. Accordingly, the Court is far from convinced that Celanese engaged in inequitable conduct in obtaining the '806 patent, and the Defendants' motion for judgment on this basis is DENIED.

IV. Enhanced Damages and Attorney's Fees

Based on the jury's finding of willfulness, Celanese asks the Court to treble the jury's award pursuant to 35 U.S.C. § 284. While the jury's finding permits the Court to make such an award, the decision whether to enhance, and to what degree, is vested in the sound discretion of the Court. *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 826 (Fed.Cir.1992). The decision is guided by factors which overlap those governing the willfulness finding, including: (1) whether the infringer deliberately copied the idea in the patent; (2) whether the infringer investigated the scope of the patent and acted on a good-faith belief that it was not infringing a valid patent; and (3) the infringer's behavior as a party to the litigation. *Bott v. Four Star Corp.*, 807 F.2d 1567, 1572 (Fed.Cir. 1986). Additional factors the Court might consider are: (4) the defendant's financial resources; (5) closeness of the case; (6) duration of the defendant's conduct; (7) remedial action by the defendant; (8) defendant's motivation; and (9) whether the defendant attempted to conceal its misconduct. *Read*, 970 F.2d at 827.

Initially, the Court notes that both the preparation and presentation of this case by trial counsel for all parties manifested the highest standards of professionalism and

talent. Indeed, the Court is unfamiliar with attorneys who could have presented the party's respective positions more persuasively. Accordingly, the Court's opinion as to enhancement should by no means be read as a criticism of the conduct of any trial counsel. Moreover, by this opinion the Court in no way wishes to impugn the subjective conviction of any of the Defendants' agents as to the merits of their case. Rather, the Court's analysis of the enhancement factors focuses solely on the objective reasonableness of those convictions, and on the objective propriety of the Defendants' actions in light of the controlling patent law.

With that caveat in mind, many of the *Bott* and *Read* factors favor enhancement. As discussed above, the evidence at trial clearly established that the Defendants deliberately based their infringing process on the ideas embodied in the '806 patent. By its finding of willfulness, the jury implicitly rejected the Defendants' contention that they acted in good faith in using the infringing process, and the Court agrees. Rather, the Defendants blatantly attempted to avoid an arguably literal interpretation of one relatively unimportant limitation of the '806 patent, with no concern for the fact that their process was clearly the legal equivalent of the invention claimed by the patent. Furthermore, the Defendants presented no evidence that, prior to implementing the accused process, they had sought or obtained the advise of counsel as to whether the process would infringe this patent. Also, while the Defendants claim to have ceased using the infringing process, they attempted to conceal this fact from discovery, and evidence suggests that they have simply shifted their efforts from directly infringing the patent to inducing infringement at a customer's facility. Finally, while the Defendants presented a relatively strong case with regard to the issues of obviousness and claim interpretation, they also pursued numerous defenses which could be generously described as weak.

On the other hand, there are degrees of willfulness, and the willfulness issue certainly presented the closest question at trial. Although the jury found the Defendants' efforts to avoid the patent to be more correctly characterized as an exercise in splitting hairs than as a good-faith effort to meet their duty not to infringe, the Defendants' choice to use the Purolite resin was nonetheless clearly based on *some* argument that this resin's properties fell outside one literal interpretation of an admittedly inexplicit limitation of the '806 claims.

Moreover, the Court is of the opinion that, were it not for the doctrine of equivalents, even the infringement issue would have presented a very close case. This is significant because the doctrine itself defines the very gray boundary between permissible and infringing behavior, in an attempt to resolve the tension between the competing policies of patent protection and innovative competition. The doctrine prevents potential infringers, such as the Defendants here, from freely appropriating patented ideas through hypertechnical interpretations of the patented claims. It conflicts, however, with the policies that a patent should precisely define what is claimed, *see Charles Greiner & Co. v. Mari-Med Mfg., Inc.*, 962 F.2d 1031, 1036 (Fed.Cir.1992), and that competitors should be encouraged to "design around" a patent, *see Westvaco Corp. v. International Paper Co.*, 991 F.2d 735, 745 (Fed.Cir. 1993). Accordingly, the Court is of the opinion that maximum punitive damages are less appropriate when a finding of willfulness is largely grounded in the doctrine of equivalents. To find otherwise would be to unjustly reward patentees for their lack of clarity and completeness in drafting their patent.

For these reasons, the Court GRANTS the motion for enhancement to the extent that the damage award should be enhanced by 100%. This figure is calculated to adequately deter infringement of the type at issue in this case, and to attempt to insure that the infringers do not

profit from their activities at the considerable expense and inconvenience of the patentee, while acknowledging that this case does not present the extreme circumstances of the most egregious types of patent piracy which would warrant treble damages. Moreover, the Court does not find the facts of the case to be so extraordinary as to warrant the award of both an enhancement and attorney's fees; therefore, Celanese's motion for attorney's fees is DENIED.

V. Permanent Injunction

Celanese asks for a permanent injunction against infringement of the '806 patent by the Defendants. Once a patentee has established infringement of a valid patent, the Court may, in its discretion, enjoin further violation of the patent by the infringer. *W.L. Gore & Assoc. v. Garlock, Inc.*, 842 F.2d 1275, 1281 (Fed.Cir.1988). Such relief is generally granted as a matter of course, and should only be denied in the face of "very persuasive [evidence] that further infringement will not take place." *Id.* at 1281-82.

Defendants do not contest the general propriety of an injunction, nor do they make any representations that they would be disinclined to use the infringing guard bed in the future. However, they first ask that the language of the injunction track the language of the '806 patent, beyond the language proposed by Celanese, by including the limitation that infringing resins be "stable in the organic medium." As the Defendants have hotly and unsuccessfully contested the definition of this term, the Court has some trepidation that the Defendants propose this addition solely as an excuse to buttress the possibility of claiming, at some point in the future, the benefit of some supposed ambiguity in the injunction. The Court is confident, however, that other language in the Order clearly indicates—and this Court will not hesitate to so hold—that the Defendants will be in contempt of the Order if they attempt to practice the processes claimed in the '806 patent with any "colorable variation" of Purolite C-145.

Accordingly, the Court will sustain the Defendants' objection as to this language. Otherwise, Plaintiff's motion for injunctive relief is GRANTED.

Defendant's also ask for a stay of the injunction pending final disposition of both this case and the pending reexamination proceeding. To qualify for a stay of injunctive relief pending appeal, a party should show: (1) a strong likelihood of success on the merits; (2) irreparable injury to the movant; (3) the lack of substantial injury to the non-movant; and (4) that the public interest favors a stay. *Standard Havens Prod. v. Gencor Indus.*, 897 F.2d 511, 512 (Fed.Cir.1990).

Rather than attempting to meet this test, however, the Defendants merely point out the pendency of reexamination and cite a non-precedential case which suggests the propriety of a stay in these circumstances. Moreover, the evidence presented at trial does not support a stay. As discussed above, it appears highly unlikely that the '806 patent will be ultimately found invalid, either on appeal or reexamination. Furthermore, the Defendants claim that they no longer use the infringing process; indeed, at trial they attempted to minimize the beneficial aspects of the process. Therefore, it would be disingenous for the Defendants to now claim that an injunction against use of the process would irreparably harm them. Accordingly, the motion for stay of the injunction is DENIED.

Finally, the Defendants ask that the injunction contain language of self-termination in the event of reversal on appeal or a finding of unpatentability in the reexamination proceeding. This request, however, posits itself to speculative circumstances which can be easily addressed, as a matter of law, on their occurrence. Therefore, the request is DENIED.

VI. Pre-Judgment Interest and Costs

Celanese requests pre-judgment interest based on the average prime rate of 6% for the relevant period, com-

pounded monthly, based on an assumption that royalty payments would have been made quarterly. The Defendants suggest that the interest rate should be based on the average three-month United States Treasury Bill rate of 3.21%, compounded quarterly.

The Court has substantial discretion in determining the pre-judgment interest rate in patent infringement cases. *Datascope Corp. v. SMEC, Inc.*, 879 F.2d 820, 829 (Fed. Cir.1989), *cert. denied*, 493 U.S. 1024, 110 S.Ct. 729, 107 L.Ed.2d 747 (1990). In making this determination, the Court is mindful that the purpose of pre-judgment interest is solely to compensate the patentee for the lost use of the royalty income he should have been paid. *Bio-Rad Laboratories v. Nicolet Instrument Corp.*, 807 F.2d 964, 969 (Fed.Cir.1986), *cert. denied*, 482 U.S. 915, 107 S.Ct. 3187, 96 L.Ed.2d 675 (1987). Accordingly, the Court finds the T-bill rate to be the appropriate standard, and the Court adopts the Defendants' calculations for pre-judgment interest through the end of 1993—$151,526.00.

Defendants also argue that pre-judgment interest should only be awarded through January 21, 1991—the date of the verdict—on the grounds that Celanese's right to recovery was established on that date and hence the appropriate relief after that date is post-judgment interest. Given the Court's determination that the T-bill rate is the appropriate standard for pre-judgment interest in this case, however, this distinction makes little, if any, real difference in total liability. *See* 28 U.S.C. 1961(a) (post-judgment interest established by the 52-week T-bill rate). Moreover, the jury's verdict did not entirely dispose of the issues in this case, as the outcome of the Defendants' equitable defense has not been decided until today. Therefore, before today Celanese's right to recovery had not been fully established. Accordingly, additional interest through today's date will be awarded at the rate of 3.25%, uncompounded, for a total prejudg-

ment interest award of ($151,526 + ((5,591,541.82 + 151,526.00) × .0325 × 67/365)) = $185,787.72.

Celanese's bill of costs is also allowed, in the amount of $24,801.20.

* * * *

In sum, the Defendants' motions for judgment are DENIED. Plaintiff's motion for enhanced damages is GRANTED to the extent that the damages award will be doubled. Plaintiff's motion for attorney's fees is DENIED. Plaintiff's motion for a permanent injunction is GRANTED. Pre-judgment interest is AWARDED in the amount of $185,787.72, as is Plaintiff's bill of costs in the amount of $24,801.20.

If the parties can present to the Court compelling and relevant new evidence or legal authority affecting these issues, which they could not through the exercise of due diligence have presented on original submission of these motions, the parties are, of course, invited to bring these to the Court's attention. Otherwise, the parties are ORDERED to file no further pleadings in this Court, including motions to reconsider or the like. Instead, the parties are instructed to seek any further relief to which they feel themselves entitled in the United States Court of Appeals, as may be appropriate.

IT IS SO ORDERED.